NBC NEWS -STS-1 Landing (4-14-1981)

https://www.youtube.com/watch?v=wdkA2RbBFrU (https://www.youtube.com/watch?v=wdkA2RbBFrU)

Uploaded by DANNOTCH'S NEWSVIDEOS (https://www.youtube.com/channel/UC7X0LKts7k4FT498Id_x5sg) on Sat Apr 24 2021.

From Tuesday, April 14th, 1981 NBC NEWS coverage of the landing of STS-1, The first Space Shuttle mission. Columbia landed at Edwards Air-Force Base in California at 1:20:57 P.M E.T, wrapping up a 54 Hour 20 Minute and 53 second mission.

- Coverage runs from 12:00 P.M E.T - 1:29 P.M E.T

  STS-1 CREW:
  Commander: John Young
  Pilot: Bob Crippen
  (April 12th - April 14th, 1981)

00:00:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU)

following nbc news special report so live from the dryden flight research center at edwards air force base in california nbc news covers the landing of columbia sponsored in part by ford and your ford dealer who invite you to test drive the exp america's new personal sports car here are nbc news correspondents tom brokaw and john chancellor and welcome to our coverage here at edwards air force base of the landing of the columbia which is coming up in about an hour and 20 minutes i think if you've been watching the today show this morning you know that tom brokaw has been here since dawn along with joseph kerwin dr kerwin an astronaut who flew on skylab 2 and has been with us throughout this mission which will be ending here about 10 20 in the morning uh pacific time 12 uh 1 20 in the more in the afternoon eastern time the astronauts are strapped in they are preparing now to drop out of orbit to hit the top of the earth's atmosphere at about 24 times the speed of sound some flight that will happen in about 20 minutes they will be landing here as i say in about an hour and 20 minutes if all goes well all is going well here on the ground the temperature is in the 70s the winds are variable at three to five miles an hour that is just perfect the crowds are big and everybody's ready right tom they are indeed john they've been there's not much to get ready out on the airstrip it turns out this is a dry lake bed rogers dry lake bed at

00:02:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=120s)

dry lake bed rogers dry lake bed at edwards air force base about 100 miles northwest of los angeles it is an historic place it is used regularly by the air force it was here that chuck yeager landed the x1 after being the first man to break the sound barrier the sonic barrier with an experimental plane what will happen is that we'll expect that the columbia will make a run over the top of the lake bed then circle back and land here on a runway touchdown and roll about 8 000 feet but space is here in excess at the edwards air force base and the rogers dry lake as a matter of fact as a matter of fact we're going to show you a little map now of what the situation looks like and what you can expect to see later on there it is i'm told on the monitor well i can't see it on her so i just trust that it's there and being telecast to you from new york at any rate they come in over the northern coast of california around the monterey bay area and they drop down across the central part of it as you can see bakersfield and then they make the pass over the top of the lake they'll be in a in a tilt a pitch down if you will at 22 degrees that's very steep because if you come in in a china and a commercial airline you're at about three degrees and john young will be at the controls he'll have no power on the columbia he'll touch down then by flaring back and then roll to a stop and they'll be in for 45 to 50 minutes altogether joe kerwin as they send out special units to take a look at the craft and to make sure that there are no toxic gases and so on involved in a careful power down and a cooling down of it all together because there are lots of very sense instruments on board and back there in that lake bed as well we won't see them today buried deep our primordial brine shrimp little legs and when they get a little water on it they come to the surface but we won't see them today we trust them well we may we're seeing everything else around here they we're as we said at edwards air force base which is north of los angeles in california in the mojave desert

[00:04:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=240s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=240s)

in california in the mojave desert this is rogers dry lake but the mission is still being controlled from houston and roy neal has been there throughout roy are you still there yes indeed john good morning to you and tom and joe that desert sun looks mighty bright from the way all of you are squinting out there in the desert but the lights are down here in the houston area as we watch instruments and all the rest of it as a matter of fact let's get a fix right now on where these athletes are they have just been given a go for deorbit burn from joe allen in mission control that burn will happen at 21.5 minutes after the hour that's joe the fellow with the headset uh in the center of your picture there now grinning and smiling looking over to his left his assistant they're listening as a matter of fact to the astronauts looking good including the crew there are exceptions to every room right now they are they've just passed ascension they're coming up africa that's on the night side of the world by the way to bring them back will be made at 21.5 minutes after the hour they're reading biomedical sensors here in houston and they say the group is looking very good very healthy uh there will be no more television from space but there was some earlier which we'd like to show you right now uh the tape that was made early this morning as they were closing the payload bay doors everything is looking super [Music] mission control telling us that data only will be received over botswana an african tracking station mentioning that we're about 15 minutes away from the important deorbit burn the spacecraft has been put into a correct attitude to make that burn in other words it's now facing aft and forward so that when the rocket engines are burned it can slow down and this picture of the earth down below is not the picture they are seeing right

[00:06:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=360s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=360s)

is not the picture they are seeing right now they're getting ready to come in and getting ready to burn first of all over the indian ocean but it's a good view of how the earth was this morning for the astronauts tom my troy neal we're told that those astronauts have a go for a deorbit burn everything looking good for the columbia shuttle orbiter we'll continue with our coverage of this historic flight and its landing today right after this a very important role in the orbiter the columbia and the important role is that he flies the 747 that you often see beneath it yes the kind of a piggyback arrangement and you got this one down to cape canaveral that's correct is that a tricky piece of flying putting the 747 with that kind of a payload on top of it well it really isn't uh it's a a little different because you're in a sort of a test environment and but uh the 747 is an excellent airplane and we aren't flying it any heavier anything we would without the orbiter on top the only thing is we have our load distributor differently we've got it on top rather than the fuselage you've been flying here at uh the rogers dry lake bed uh what since 1950 i think all again yes that's correct air force test pilot for a long time i was air force and retired in 66 and then went to work for nasa's test pump as you look at the columbia orbiter as a piece of aircraft it's how does it strike you well i do look at it as an aircraft because uh once it gets overhead here it really is an aircraft it's a spacecraft in its present mission but uh it's a it's a fine flying machine the test we've had here where we dropped it and they they made five landings those were all good landings and it flew well they were uh you know certainly little problems that had to be worked out and they were taken care of but it's going to ask you a question sure could you bring that the columbia in on computers alone without human beings on it uh i think it's certainly technically uh possible it could be done but you'd have to have a completely different arrangement the the flight control system and the computer system there are systems that are in there could be adapted for remotely

[00:08:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=480s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=480s)

adapted for remotely piloted operation but it would quite take quite a bit more engineering to do it as it sits right now we've been kind of sitting around gasping and saying oh my gosh it's going to come in here at 40 degrees and then pitch down to 22 and it's going to be hitting speeds of mach 2.5 just north of here up near bakersfield by the time it hits here it's going to be about 215 miles an hour that's how something's going to drop like a brick we've been saying now you're a test pilot are you a little amused by the way we've been going on and on about all this well i don't uh quite use the term drop like a brick uh but it you know it uh it has a glide ratio that's uh acceptable and it's very similar to uh oh the x1 the x15 and the x-2 and some of those rocket research airplanes the lifting bodies that we've dropped previously and many many thousands of approaches have been done with an f-104 the t-38s or the gulfstream train airplane that give you the same glide path and the same glide ratio so you can do just the same thing that they're going to do this morning one of the things that pilots like to look for is space whether you have it upstairs or down here on the ground and as you look out across this rogers dry dry lake you have more than enough space to get her down and land safely we don't have to worry about rolling into us at that point oh no there's a plenty of room and i think he'll stop well well clear of us one of those runways out there was seven and a half miles the north south and the one he's landing on is probably in the order of five miles and he'll uh probably roll out with still maybe uh two two and a half miles remaining every time he stops is this dry lake bed a lot smoother than a lot of the commercial runways that we'll land on around the country well certainly uh some of them that you end up flying off of this is smoothly you find some older commercial runways where the concrete is buckled and uh end up uh being a little rough but the lake bed here is very smooth most of the time we just i just see somebody's pull let's just bring that right on over here because we've got finally a model to show you if we can just as we're going off the air if it's of how you fly things go ahead and have somebody send it in to us

[00:10:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=601s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=601s)

somebody send it in to us not to worry about it this is this is what it looks like i think it's the dog on this looking airplane you heard this is a big airplane with this baby the baby in this case is the spacecraft that's marvelous it really is something to look at right now it'll fall off bits well maybe the model but not the real airplane and you've got a couple of special attachments back here that you wouldn't see in a commercial supplement yes actually those are to increase the directional stability because as the shuttle sits here it knocks off some of these stent fin and so you've got these to increase the stability and otherwise it flies pretty much like a standard airplane a little slower and a little not quite as high once the columbia gets back you take it back down to cape canaveral uh that's correct all right and you'll be doing it we presume after a successful lander today kids well we're looking forward to that landing and that's correct thank you very much and so later thank you very much we'll be back with more coverage of the landing of the space shuttle columbia after this [Music] astronauts young and crippen are now somewhere by my reckoning over east africa southeast africa and they're traveling this way in relationship to the earth backward and upside down and they have been given approval to start their rockets to bring them down to the atmosphere and we map here that we can show you where familiarize you with some of the terms that are being used uh the deorbit burn down lower left-hand part of your screen will take place over the southern part of the indian ocean and then they have a post orbit maneuver which will turn them around and face the spacecraft with its nose pointing toward the united states and its bottom pointing toward the sea and then as we go up to what is called entry interface which is not very technical that means that they that is where at 400 000 feet the columbia meets the top of the earth's atmosphere about 4 300 miles away from here and that is when the difficult part the dangerous part of this mission

[00:12:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=720s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=720s)

the dangerous part of this mission begins and that's when it starts to come down and to heat up and shortly after that we believe we'll be seeing the columbia here and that's what you'll be hearing about the main thing to watch if you're starting your clocks is entry interface and the deorbit burn astronaut kerwin and i were talking about this earlier and the one thing the one variable i suppose which probably isn't very variable on this min is the time of that burn the time in which they fire their rockets to slow them down and joe if that burn works the way their they plan it to work it will automatically almost touched down here but if it's a little short or a little long burn then we have we have we're going to have to worry a little bit then they have to exercise all the capabilities of that orbiter in either stretching out or shortening up their flight path does the computer say how long the burn will be or is there a human up there with his hand on a switch the computer says how long the burn will be in the human monitors now they're starting to burn a little early this occasion simply so that they have time if one of the ohms engine fails to recompute for the second one if both of those engines fail they can recompute for the reaction control system they have three ways to finish the burn but no induction from the talk you've heard from up there that they would have anything no no no no that's that's all a precaution you guys think of everything i'll say that that's right that burn coming about three minutes from right now i think we look 9 21 about 21. it's about three minutes away well once they get back into the earth's atmosphere and in all of the earth it's still it's still a pretty hairy approach and we want to show you what happens now as they make their approach to edwards air force base and the rogers dry lake behind us using adam plus film of an earlier test landing here at rogers roy neal now describes the landing sequence the shuttle which is part airplane and part spaceship can't simply dive through the atmosphere as it encounters more air resistance it must flatten out into a kind of mushing

[00:14:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=841s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=841s)

must flatten out into a kind of mushing maneuver which presents the broad underside of the craft to the frictions of entry heat builds up may reach almost 3000 degrees fahrenheit to withstand this the craft is protected by individually fitted insulated tiles here now is a landing as it looked back in 1977 when the shuttle was taken up the back of a 747 jet released to land on a lake bed at edwards air force base in california 90 knots four thousand feet three thousand feet two nine a little faster leave them out three player [Music] orbiter gear okay get the gears coming okay 200 feet 260 knots you're looking good 250 knots 249 239's five feet 220 knots four feet two feet knots 200 knots down 190 knots speed brakes are tracking everything's coming down two feet one foot down roy neal nbc news [Music] so we're about a minute and 45 seconds by our calculations which may be off a little bit away from this absolutely important and decisive maneuver the what we call the ignition of the uh of the deorbit the thing that will slow them down and bring them into i guess collision would be one word with the the very very thin air there at the top of the earth's atmosphere that air as it builds up in uh in density will cause the friction which causes the heating which will cause a communications blackout we will not be able to hear them for a few minutes because of an electromagnetic effect that goes around the whole spacecraft as it's coming down because of that terrible heating heating up to maybe 2700 degrees fahrenheit something that i think beings can't comprehend i guess we wasn't for what 13 minutes all together

[00:16:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=960s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=960s)

wasn't for what 13 minutes all together 12 to 13 minutes down in the blackout well yeah between the blackout and the uh and the fact that we're in between stages [Music] i mean if you keeping a watch on this at five minutes before the hour uh coming up until about uh seven minutes past the hour that's the critical time that'll be the communications blackout and that will also be the maximum heating of the spacecraft it will get quite hot up there as those tiles absorb the heat and keep the systems inside operating at normal temperatures also have a lot of thermal insulation inside the spacecraft so i'm tempted to ask you how hot will it get as they might say because i know that you have that information very handy there as well how hot inside no not out here on the wings we're talking about oh on the wings will it wait a minute let's listen let's listen to mission control two minutes they are way in space somewhere over the in pacific ocean and the computer with a human astronaut monitoring it has press button and that means these engines are burning it's upside down and backwards to slow it down and bring it down into that first edge of atmosphere and then as i say the critical phase of this whole landing operation at the end of a brilliant flight this is the one thing we have to get through the uh the pilots who fly these things tell tom and joe and me that uh once it's beyond that then it's a matter of of flying the machine and they're very confident about that um it's a very good machine they say to fly it would scare me and most of us half to death to be in it dropping at 20 degrees like that as tom wolf the author said uh

00:18:03 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1083s)

like that as tom wolf the author said uh the the downward gliding path of a thing like the columbia is the same as a pair of car keys thrown to the ground in a parking lot i don't think that's really overstating it except that the car keys don't have two good pilots aboard those are the chase planes from nasa which are getting rid of liftoff here at edwards air force base at the rogers dry lake and they'll be up to accompany the columbia orbiter as it makes its final pass across this lake and then go down it's not just a ceremonial escort they'll be helping they'll be talking about altitudes they'll be talking about pitch and degree and in communication with the commander who will have his hands on the controls of the columbia orbiter that would be john young and if anything falls off they'll be pointing i'll be talking as well uh and they'll also be sending us television pictures uh here's mission control now listen control center the clock that had been counting down towards the orbit ignition has been re-established a touchdown clock now reading 58 minutes 16 seconds to touch down at edwards yogurty comm tech this is huge testing you procedure is still on it's going to cut off now in about 20 or 30 seconds and we will then hear from mission control in houston confirmation that this critical is hardly the word this a decisively important maneuver has been done it should be over in just a few seconds now let's see what they say in houston they are getting signals from space that will tell them about them they will shortly at yargety uh they will they will get communication

00:20:02 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1202s)

uh they will they will get communication with the crew that's going to be a couple minutes after the burn is over joe they said earlier they were going to a secondary uh system on this burn weren't they because they were developing stubbles one of the two engines which has gimbals to move it to steer the uh the straight the primary gimbals were a little sluggish they went to the secondary gimbals told the crew they could go back to the primary gimbals if they needed to there there's still there was no sweat they were just going to secondary that's no problem we want to hear that this burn was was nominal but of course we expect to we're still waiting to hear from houston that the burn has been concluded and that burn should have been concluded about one minute ago i'm sure it has it's just that houston doesn't can't confirm it yeah uh houston is getting various signals from called telemetry in the trade uh from the spacecraft coming down they are not yet a communications blackout so signals can still be heard and will be heard from colombia for some time to come we're just waiting now for confirmation that the spacecraft has in fact made what is called the uh the deorbit burn correctly and begun the drop into the at the top of it at any rate fiery reaches of our own atmosphere we'll be back with more coverage after this these symptoms are that if the burn is beyond a certain amount too short then we will uh continue on to northrop airstrip in new mexico's white sands missile range in new mexico and we can retarget the guidance to do that

00:22:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1321s)

we can retarget the guidance to do that and that's exactly what the plan will be depending on how much short the burn is and as we've all said dan so often this mission has really been flown thousands of times in simulators computerized uh flight programs and these people here are convinced that uh those problems will not exist during the final stages of this flight and we certainly hope not [Music] that's the reason that al bean and jack lousma keep emphasizing that uh once you've done it and once you know it can be done that it builds that kind of confidence what's happening at the moment that the deorbit burn has been completed successfully so the crew is in the process of trying to start all three of the auxiliary power units now these are the units that help provide that do provide the hydraulic power for the columbia's flight controls when it gets back inside the atmosphere again the elevons the rudder and the speed brake now there has been a problem with one of the auxiliary power units and we're hoping that all three of those auxiliary power units will work it's not critical that all three work uh they can do it with one of the auxiliary power units can they not leo crop that's correct dan there shouldn't be any problems with the apu's but one point you ought to bring out is that the time has elapsed the deorbit burn has been completed according to time but we won't know whether it's successful or not until we pick up our next communications with australia which should be very shortly i believe that we're picking up those communications now let's see if we can't uh get houston mission control talking uh to the spaceship on how the deorbit maneuver win should have acquisition in about 10 seconds we'll stand by 10 seconds until the time they believe they'll be talking with the astronauts and can check out how successful the deorbit burn was this communication will be coming through australia we are approximately one hour to landing time columbia this is houston through yargety we're standing by

[00:24:02 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1442s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1442s)

yargety we're standing by time [Music] [Applause] the picture you see is chase planes taking off in edwards air force base to put themselves in position the voices you hear the astronauts talking about the shortest of all burn reports and uh crap we understand you have two of three apu's running now the burn was on time and uh nominal all three of the auxiliary power units are running okay and that's good news just two right now raj thank you this is mission control there may be confusion as to whether all three of those auxiliary power units are working okay but at least say two and three were running interface minus five minutes we're now at the entry interface minus 19 minutes 22 seconds that the voice of houston mission control talking to the astronauts in space they the astronauts roughly one hour away from their scheduled landing here at edwards air force base in california the astronauts are preparing to re-enter the earth's atmosphere and go into the blackout period in which they lose all communications and the period in which the spaceship undergoes tremendous heat that 2600 2600 fahrenheit height temperature actually slightly above that temperature they're preparing to go through that our coverage of the landing of columbia will continue after this pause for station identification [Music] this is cbs there's one tuna that's so delicious people can't help singing its praises

[00:26:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1560s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1560s)

12 chloe take it back until those seeds people are going to be able to see it but from the position we're at it looks like they may get maybe 20 seconds to watch the shuttle come in for the landing and some of the people had such a difficult night out here they're asleep in their campers right now so uh for some of their friends they're going to wake them up get them up in time to watch the shuttle land now back to you on the west side of the lake um now let's get you up to date when we saw the we last had this model up in the air the astronauts were upside down and backwards they have now completed that maneuver that decisive maneuver it went perfectly and now they're this way the way it ought to look it seems to me and they are heading they're somewhere over the indian ocean they are heading for guam at about this time they'll be at guam before long and then they will to enter the earth's atmosphere but that's where they stand now facing forward bottom down well like that [Music] nasa has invited about 6 500 people who are called vips to be here at edwards air force base to see this landing which is scheduled for i guess less than an hour from now and heidi shulman is with some of those people now heidi the guests have been moving in here to the vip center for the last couple of hours among them congressman don fuquay chairman of the house committee on science and technology we were standing here when we got confirmation of the deorbit burn and you it you've been following this thing for some time well it was a very critical maneuver and we're all very pleased that that happened and uh i think they're on their way back now uh safely they still have some critical maneuvers to make but that was a very crucial uh part of the mission and it was accomplished successfully you flew out here on an air force plane along with other members of congress i wonder what the attitude is of your colleagues in a very very successful mission do you anticipate this will increase support for the space program in congress well

[00:28:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1680s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1680s)

for the space program in congress well we've had a lot of members of congress that have been involved in the space program for a number of years we have some new members that have not been uh as fully involved and they've been very excited and i think uh appreciate the fact that there has been a large amount of taxpayer funds but we feel like the benefits uh certainly justify that and we think the program uh has been very successful thus far and we're very delighted uh that of the success that has happened thus far you couldn't have asked for a better day out here how much you're going to be able to see from this location on the lake well i think we can see real good uh it looks uh rather clear and i think once it comes in uh it will be a very good view here okay congressman thank you we're going back to tom brokaw thank you heidi let's listen now to houston talking to columbia call me talking to houston right now the orbiter was just told that four chase aircraft have just launched you've convinced us and yeah but you're so easy john young i think it was who said well we'll be there in about 35 minutes check their six o'clock that's my great scientific relationship the astronauts seem to be very calm and uh you never heard of texan do that oh that's crippin the texans that was cool not from porter texas and we're 30 seconds from los angeles looks like about six minutes from now

00:30:04 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1804s)

i'm not sure what's going to happen in five or six minutes from now if you've just heard that are you joe uh we called for the next thing columbia is ours now and uh and that will be the the the hit on the young reporters which means the orbiter's exact knowledge of its own position if necessary it may not be necessary in this case and then they'll pass out of out of communications with guam and a minute or two after that they'll be at the top of the atmosphere all right well while we're waiting for that we'll have more coverage after this night sky generally you're from earth it's a real shiny almost like patent leather shoes if you wonder why but there it is the astronauts are again in radio contact with mission control perhaps we ought to try to pick up just a smattering of counting down shows touchdown in 45 minutes mark 45 minutes from this time jack riley in mission control here in the control center flight director don putty has just informed his team on the flight director's loop that after to down after the nose wheel touches down his team will have exactly 15 seconds to whoopee and then it's back to business again because the crew will not be able to get out of uh columbia for approximately 45 minutes after landing until aircraft till the spacecraft is powered down and all the systems are safe so this flight control chamber will still be in business [Music] testing one well the chase planes have taken off from edwards air force base here in california put themselves into position

00:32:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=1920s)

california put themselves into position so you from time to time will be hearing aircraft overhead as the chase planes uh there are four of them flying in very close formation get themselves into position now here's something you can look for as our coverage goes along there is a television camera in one of those chase planes and at a certain point after the columbia becomes uh and a glider it re-enters the earth's atmosphere and begins uh this kind of brick-like drop toward edwards air force base here at one point you we hope to show you a picture from one of the chase planes a television picture of the columbia as it comes down towards the air force base you're going to have to be watching straight along because all of this is going to happen very very quickly cbs news coverage of the landing of spacecraft columbia will continue in just a moment vault edwards air force base where the landing is scheduled of the shuttle in about 40 minutes give or take a minute or two what we call the planes have taken off four t-38 planes two of them to advise the astronauts about the condition of the aircraft when it comes down and we can soon call it an aircraft really a glider and two others to take television pictures which we'll be showing to you the uh space shuttle columbia is on its way toward guam now and in about um nine minutes will begin to its descent through the earth's atmosphere roy neal is standing by at mission control in houston roy and help with me too judy resnick astronaut is here right now we've been listening and following this flight and uh as it stands right now let's see let's let's judy let us call up a clock from mission control which will give us some times and what have you there it is right now we've seen the time of ignition that's from the deorbit burn next to that is gmt then we have phase elapsed time that's the time of the spacecraft on the spacecraft clock aos that'll be the time until we get in contact with guam isn't that right judy that's correct uh we'll pick up guam in about two and a half minutes

00:34:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2040s)

two and a half minutes uh we'll hit the atmosphere in nine minutes the atmosphere is ei ei is called entry interface which means hitting the atmosphere that's 400 000 feet on td td is touched down in 41 and a half minutes just like that there is a time in there which is not shown on that clock during which they will be out of contact with the earth they'll not only not be passing over any tracking stations they couldn't communicate if they wanted to that's correct once they hit the entry interface there's about 15 minutes where they're in what's called communications blackout because going through the atmosphere and the heating and the ionization of the air around it you can't pick up any signals from them and so by the time we hear from them again they will have been through the most crucial parts of the flight now when they come out of that which will be about seven and a half minutes after the hour judy will they be within range of a tracking station in other words when they finish blackout will we be able to hear them and thereby know that they've successfully survived entry yes we should pick up both radar and voice as soon as they get out of black i might the radar might come up a little bit sooner than the voice but they ought to be out about the same time all of this happening of course on the far side of the world from us as they start to move in toward the continental united states but they still have quite a way to go tom john thank you roy um one of the things that kerwin was talking about is that at this stage at one stage of the game in about eight or eight minutes or so it's going to become what you called a hybrid isn't it right it comes in of course at this 40 degree angle and as it reaches the sensible atmosphere notice all atmospheres the palpable or beginning to be dense enough to use airplane type control surfaces the rudder is blanked out no wind flowing over the rudder the rudder is useless so you have to use the yaw jets no wind flowing over the rudder the rudder is useless so you have to use the yaw jets the reaction control jets on the rear in

00:36:02 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2162s)

the reaction control jets on the rear in order to steer the airplane and keep it straight in yaw very early you turn off the roll jets as the ailerons become effective shortly after that you turn off the pitch jets yes the elevators become effective you keep those yaw jets on down to less than a hundred thousand feet and essentially operating it as a spacecraft this way an airplane that way we're expecting to hear from the columbia orbiter as it speeds its way toward edwards air force base they're about to pick it up over guam through guam please configure aos we'll be with you for five minutes okay we've configured aos the doors are coming closed at this time roger we will we copy and we're looking at the numbers after that for dr fitdell mission recorder following running so after these conversations with the ground and the doors are closed we won't hear from the astronauts again until they're in our atmosphere about eight what's going on in the flight deck right now joe what are they doing see the very pu star what a great deal they are waiting for the ground to tell them how good their state vector is and they're probably mentally reviewing what they have to do for the hundred figures that still could but probably won't occur we've never flown an airplane at mach 25 nobody has the third hydraulic power called an apu has now been turned on and is working that's the one they don't need that's the one that is extra

00:38:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2280s)

[Music] insurance and that's just what joe curran was talking about need these hydraulic units when it becomes a more of an aircraft in a spaceship that's right nothing like this has ever been done before first time the spaceship will be turned to a glider to make a wheeled landing on the earth nothing even remotely like i note with this that when they enter the etnder they're 4500 miles from here that's right and when we see them again after black they're only about 500 miles away that's a long trip in the dark i'll tell you that all right they are safe all their power units are working the landing is on schedule one of the very dicey parts went off extremely well this morning we've got another even more dicey part coming up but it all looks very good for that so we'll be back with more coverage of the landing of the space shuttle columbia after this control system rocking jet will help ride there right along help guide their entry uh during the first phases of the entry interface and the reaction systems itself is outdated and i believe john said the arsenals which is a reaction control jet fuel usage has been normal which says he's been doing a pretty good job of piloting although he's had a lot of help from the computers we'll explain the computers don't fly the machine do fly it actually but only in response to the pilot's commands the pilots control the space throughout the houston no delta t required what does that mean what does that mean gene well i put a delta t or delta for temperature change

00:40:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2400s)

delta t or delta for temperature change it probably means turning on the heaters warm up the reaction control so that they fire efficiently the first time if they're cold they may sputter everything looks perfect going over the hill nice if he does it john we're all riding with you i think joe allen the captain i thought it was brought in here the capcom was right they've got co-pilots on this uh this entry millions of things you betcha los means loss of signal when the radio signal is gone and they can't talk to mission control anymore and we can't hear them until the entry interface is added uh until the s-ban blackout is over some 10 minutes later uh blackout being that phase in flight to lrs we'll see about 12. and that's that's an interesting call the capcom said c at mach 12 in other words see you when you slowed down to twelve times the speed of time columbia is one minute 32 seconds away from entering the earth's atmosphere we're showing uh 34 minutes 21 seconds to touch down still about 24 to 25 times the speed of sound that's their speed so the atmosphere itself there's no propulsion system nothing else that slows them down from this time at all except the atmosphere uh they will tend to feel a very g-force or acceleration as they slow down because remember they've been in zero gravity now this force will tend to force them into their seats and for the first time they will slowly regain the the g forces that they'll be subject to here one g on on the ground when they get back and this is the single most critical time spacecraft uh where the heat the wings hold up the heat tiles stay on the structure takes it the temperature

[00:42:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2520s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2520s)

the structure takes it the temperature will start building at what they call entry interface the what happens is the the energy they are slowed down and the energy is dispelled in a form of heat and of course the heat has to be absorbed and then dissipated by the spacecraft speed of sound and so in the 4 300 miles from guam to where we are here in california it's got to do an awful lot of slowing it certainly does and as it does the the behavior of it as an airplane is constantly changing the shock waves are moving forward on the once the center of pressure is changing the computer has to keep up with all that and so does the crew joe you i mean nobody's done shuttle before but when you were up before was there a lot of buffeting when you were coming in no there really wasn't it was extremely smooth on set of acceleration they're not going to get the the same acceleration they're not going to pull the g's that you did in the old type spacecraft largely because the airplane can't tolerate the stresses so they've stretched the entry out now they are wearing g-suits we certainly don't expect them to need the g suits uh uh or to be at risk of blacking out on a mission as short as this but on long flights in the shuttle that is considered a possibility and the g suits are there as a precaution of all this has been conducted before i mean there was a test landing here of the enterprise as well apart from about over there down to touchdown let's say the last three minutes all right that was the the enterprises dropped from a 747 and the pilot at the controls at that time was colonel gordon fullerton who's one of the nasa astronauts as well and recently he talked with roy neal about just what the experience was like in the final closing phases of the landing of a space shuttle orbiter the plan is for uh as a spacecraft becomes subsonic uh slows through and becomes flying at less than the

[00:44:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2641s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2641s)

and becomes flying at less than the speed of sound and passes about 45 000 feet above the ground john will take over manual control of this of the orbiter that's about where the craft becomes a plane isn't it that's correct and uh he'll do that by placing his feet on the conventional rudder pedals uh grasping the crimp stick in front of him and then depressing these two manual takeover buttons uh mounted up here on the glare shield at that time he'll have control of the attitude of the orbiter with the stick for roll and uh pitch motions and the equivalent of the throttle in this airplane since it has no power for the uh reentry and landing is the spray controller that's this lever located at the left hand so that you control your air speed and altitude by a combination of attitude control and speed brake setting to make sure that you're coming on a for the at the right speed and right altitude as a function of your reach to the runway you can assess that condition by looking out the large windows in front of either cooper and also by checking the mock air speed indications here on the instrument and the altitude indications here and a more precise definition of that state is available here on this television play tube in a in a graphical form he will then make a sweeping left turn around and uh controlling all these things at once roll out on final approach about 2000 feet above the ground headed for the landing runway at the dry lake at edwards and uh at approximately 2000 feet above the ground close the speed brakes come back on the stick as i'm doing here and affect the gradual uh transition to level flight touching down as any airplane then have a big sigh of really you bet

[00:46:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2760s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2760s)

then have a big sigh of really you bet [Music] all right just to bring you up to date the columbia orbiter is honestly back it's still in this configuration but it's beginning to drop very rapidly now down through space into the atmosphere and we expect to see it back down here at 10 21 10 22 this morning at the rogers dry lake bed here at edwards air force base in california john young at some point will take over the controls and he'll conduct what they call a dead stick landing there's no power it becomes a glock here and it'll make a pass over the lake and then come in and land and we're all looking forward to it they'll be right over us when they take over that that full control adjustable and we may hear boom as a matter of fact everyone should be here i talked about the temperatures earlier uh 2600 degrees on the nose and back here on the wing they're experiencing this about now aren't they uh joe kerwin about 2300 degrees that they'll be going about 27.50 right there on these two places and 600 back in here it varies great one of the things that the guy who was uh dr uh kuznets was very uh encouraged by in terms of the tiles that we talked about a lot was they lost a few hearings but that's what it was the thinnest and most flexible that's right but in that same general area they had very tough tiles up here on the leading edge of the tail and he said they all stuck and that's very good news indeed because the whole bottom of course is put together with those silicon tiles that we've been talking about that will protect it from the enormous heat that's been generated one thing we might point out if we have a few seconds that they put the shuttle back into the atmosphere a little faster than they need to consequently as they are re-entering they are turning right and left away from the landing site and then back toward it to dissipate the excess energy if they're too shallow they can eliminate the turns if they're if they're if they're too close they can make them bigger one point i was talking about young trip and i said if you look like a layman it either looks like a bad crash landing or luck you're going to get picked up for driving while intoxicated and they both got a kick out of that and said that it was more like a landing on the deck of a carrier which i think is a better way of

[00:48:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2880s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=2880s)

carrier which i think is a better way of putting it the uh i've been listening to mission control and they they uh what we call the deorbit burn and the trajectory that started to follow that was called normal nominal is the word they say and they're talking now to the chase aircraft which are up there when for them to come down they're passing on those chase aircraft uh the t-38 jets the trajectory that they think colombia will follow when it starts back down and comes out uh that phrase in case collector of nass terminology is they told pilots that uh with that trajectory they could put them in the envelope that's a tricky join up as you can imagine oh sure we'll be in a racetrack pattern out here all right gentlemen we'll continue with our coverage of the uh landing now we expect a special two hours when bj and the lady truckers hauled dead cargo as crooked cops and arrival out tries to put him out of business tuesday on pc [Music] it only takes a hundredth of a cent to snap a color picture it can take days maybe longer to get your prints back but not look we don't plan to use it yes we have to well that's for sure it does not strike us being the most desirable way to leave an airplane it's a little bit embarrassing it's a very uh dependable suit used to be that these were made better for each individual astronaut but they're kind of off the shelf now small medium and large type of operation because we have lots of different people using these all right if you tell them what that is i'll move this over here this is called a torso harness mort it's over the suit that we just described and effectively what it does it allows you to strap into the seats with your attached parachute properly and here is a preserver so that if you land

[00:50:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3001s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3001s)

here is a preserver so that if you land in the water you'll be able to stay afloat and uh this has the name uh jay lousma i should have caught that earlier okay i think that belongs to you and this uh gentleman already passed that rumor around a little bit more uh we sure could uh okay let's take this down this is a rather ominous looking thing with these glasses on a little star wars activity so it looks well if you uh want sunglasses uh of course or need some glasses uh they can be adapted to the helmet it has a a device that fits closely around the face so that the air doesn't leak out and it blows oxygen to the face through these hoses so that you can breathe now of course if you eject if you eject it holds the pressure at about 3.2 pounds per square inch so that as you float down you'll be pressurized and so breathing pure oxygen has a microphone and all you need to survive until you get to the ground or the water oh thank you jack and we might remind everyone that commander young the 50 year old top kick of the spacecraft does wear glasses and will be wearing a helmet just like this my spacesuit uh make it a media we uh the we're about 12 minutes away from reestablishing communications contact with the astronauts they've gone into their communications blackout period now while they re-enter the earth's atmosphere the spaceship has been flying at just about in this manner taking most of the heat the 2600 degree fahrenheit plus temperatures under here forcing tremendous heat pressures on those tiles that's going on now but we do want to point out and by way of reminding you that the blackout itself is not necessarily a gastric in their vehicle being parachuted into the water as we've seen so often in the apollo program this one concludes herod's air force base with a touchdown at about 196 knots an hour young and crippen talked about it recently in an interview with roy neal

[00:52:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3121s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3121s)

john's supposed to talk us through the landing sequence if you will and particularly the landmarks that you'll be seeing as you come back in well we cross the coast uh at mox uh maybe 120 30 000 feet over uh right over morro bay coming in off the california coast that's if we're going to land at edwards at mach 5 we're about to bakersfield in mach 4 we'll be able to look out the window up there and see lake isabella at mach 3 we're at eighty thousand feet and it all happens about as fast as i'm talking too it is this doesn't fool around at all uh we'll eighty thousand feet beam uh the runways at mojave and we'll be over the edwards lake bed complex at uh right over the edward complex at mach 1 at about 50 000 feet then we'll be turning into what we call our big heading alignment circle as we fly around and come into the to the lake bedded runway 2-3 at edwards we're at the high key position which is uh 32 000 feet we're at the 90 position at 23 000 feet we're at the final at about 12 000 feet this is above the ground and we're doing about 275 knots 12 000 and we accelerate up to 285 or 290 to pre-flare which occurs 1750 feet above the ground we put the speed brakes in pulling those up and land the vehicle at about 185 knots sounded like you're actually flying the landing as compared to the launch we do take over the uh we do take over the program anomaly as it comes through uh the about mach .85 up there to 37 40 000 feet bob what are you doing during that whole launch of that landing sequence rather okay well again once we uh start hitting them hitting the atmosphere both of us are monitoring trajectory of the vehicle uh making sure that it's

[00:54:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3241s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3241s)

the vehicle uh making sure that it's behaving properly and making sure that the systems are functioning properly and again it's primarily a monitoring job until we get down out of black and at that point in time we start getting attacking data we receive just like airplanes for navigation purposes and we'll take a look at that particular data and use it to update our navigation state on board which is like an inertial nav system and so we look at that data evaluate talk to the ground about it and go ahead and update the system and shortly thereafter we'll get down to about 3.8 we deploy our air data probes uh which are number devices that the planes have to measure their airspeed you got to keep them in part of that time because to get hot and we look at the air data that we're getting off folks to make sure it's okay we'll start utilizing it in the system to fly the airplane and again we've got some that somewhere around john's gonna end up turning off the uh this flash evaporator we turned on going up a little bit because we're getting down in the atmosphere and i'm monitoring my ass making sure that the johns are right and coming in on the uh on the landing i deploy the gear or we back each other up on deploying the landing gear doing that when we're decelerating through about 270 units and calling out air speeds and altitudes to john to make sure that he hits the 185 knots they're pretty close to it that's right what our real job is is to monitor the vehicle and then in case it you know that's what they're paying us for we're supposed to monitor it and follow the guidance until such times as it might indicate that it's not doing right and then we're supposed to take over and uh and fly the vehicle to a safe landing and that's that's our job and if the vehicle is working normally and all these sensors are working properly well it'll be uh okay uh here's the situation as we stand now the the the critical heating of the spacecraft is due to end in about

00:56:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3361s)

spacecraft is due to end in about two minutes the blackout the communications blackout is about to end in something like five minutes call it and then uh we'll have some tracking on the spacecraft and know how it survived that burn through those terrible teachers after that'll take us to about 13 minutes from touchdown after that a lot of things will happen very very fast touchdown in about 17 minutes we'll be back with more coverage of the columbia's landing after this you don't ever know what really does it uh frank we are indeed and there really is a weed patch as you can see i'm standing right in the center of it it is a farming community a tiny community right in the middle of the desert as you said about a hundred miles away from where you are and wheat patch is not totally unknown uh the people here tell me that uh john sinbeck wrote his famous novel grapes of wrath only about a half block from where i'm standing now the real reason we're here of course as you mentioned is because the orbiter is scheduled to pass almost directly overhead it will pass just to the south of us and about five miles to the south of us at about 107 thousand feet traveling at about mach 4 or 4 times the speed of sound now the the orbiter has a plus or minus footprint of 30 miles which means the sonic boom should be heard 30 miles on either side of the flight path and we are almost as i said directly on it we don't know how loud it will be we should be able to hear it and of course when it does come over we'll be here and we'll tell you exactly how loud it is frank all right thank you and we hope to do uh to be back there we have less than five minutes now till uh the re-acquisition of uh signal as i say we hope to be back at weedlach in time to hear that uh great big sonic boom but less than five minutes now to the re-acquisition of signal of the important things is going to be the function of the landing gear whether they are retracted properly that won't until they are almost down on the deck john north has prepared

00:58:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3480s)

deck john north has prepared a reply on how critically important they are john the space shuttle will be approaching its living without power but it's going to be coming in faster than any plane ever did before the shuttle comes in from the west when it's directly overhead it's still 10 miles high still faster than the sound as it continues east several miles past the lake bed it starts a large bank all of this to cut its speed and cutting its speed is critical because the landing gear can only be drawn the shuttle's speed is less than 345 miles per hour the landing gear must be dropped early from the cockpit for this there is no computer control if the gear doesn't drop after the pilot activates it there's an automatic backup stem that opens the doors with an explosive charge all of this must be done quickly the gear is hot when the shuttle is only 19 seconds from the runway the shuttle will touch down more than 100 miles an hour on tires similar to those designed and used on the b1 bomber the brakes are constantly designed but they're made of metals that make the brakes lighter and stronger one of the reasons the lake bed was picked is that it gives the shuttle more than five miles to break to a stop even if the shuttle strays off the marked runway the lake bed will support the landing on north abc news edwards air force base california we are this thing coming down as fast as it is it's fast and it's very high because uh the t-38 is not all that maneuverable 30 000 feet if they're in the wrong part of the racetech pattern there's no way they can make that interception turn so you'll you'll hear houston give them a time hack as soon as they get trained to tell them when the orbiter will cross that rendezvous point there's a there's one of the chase planes now work two minutes i should be able to talk to supporters you think of the uh that they hold you being in a fairly small jet like that in a great big sky trying to find something coming at you with something like a thousand miles an hour which is about the size of a dc-9 it is very difficult to pick it up that's right

01:00:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3600s)

right john mcbride will be mortified if he doesn't make the join up but it's a it's a tough job and those are the pilots that were at cape canaveral when it took off yes indeed and i believe took off something like last year didn't it it doesn't seem like teasing well i was a different 34 miles up there going more than 8 000 miles an hour so they're moving right along they uh and we should be picking them up we should be not picking them up but we should be getting the first signals that they got through in about a minute 15 seconds uh so they're that close and after that a lot of things as i say happen very quickly they will pass over the big sur coast uh here in california one minute six times this the speed of sound uh and but after that i mean their critical periods are over their communications will be restored uh the uh the heating will end it will be 9 700 feet per second they will be uh turning into a glider they're dropping now at 9 700 feet and they're going us by mark i thought we got an acronym i thought we did too this is really the most important thing disregard the mach 9 call it again shortly they could be off course shall we say third damage all kinds of damage is coming down here that in about 15 or 20 seconds range to go 110 nautical miles standby for mark on 9 700 feet per second hello christian [Music] and couldn't agree more john your state vector is good we've got good data in house in-house now we think we may get a picture of it a little tiny spin on your screen and you're going to have to look very closely

01:02:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3720s)

closely mark mach 9 at 9 700 feet per second this from the air force long-range camera energy perfect ground track and as you can hear i think uh nine times perfectly move down light dynamics rolling right looking [Applause] good rolling now we've got to slow it up a little bit as they come in chase will be on time okay those are the chase aircraft altitude 152 000 feet range 311 miles speed mach 8.8 well they're right on the board reversal complete columbia we show you out of 151 k now 8.4 mark looking good and i got a solid lock on uh [Music] roger that trip we're looking approaching the coast of california now all three apu's hanging in there looking good roger their hydraulic system [Music] that looks like it yeah you can see it outlined in the coast now yeah six point six hundred and forty one thousand feet range 240 miles attack hands go ahead and take them okay we are now just about 10 minutes away from touchdown here at now including tactical air navigation system data into the spacecraft mach 7 135 thousand feet range 221 miles [Applause] dead on the ground quiet to it what a way to come to california to come to california

01:04:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3840s)

columbia you're out of 130k now on the tracking 6.4 mark looking good [Applause] only agree with those numbers range 177 miles [Applause] and john we're seeing near zero aileron uh we sent two tests yeah less than that now roger that out of 119 k 5.5 all black reports [Applause] 4.8 times john young rolling using annual control now we see dale as 21 degrees mach 4.4 107 000 feet range 112. near the tehachapi range now mountains in california [Applause] john has a control and nasa terminology is terminal area energy management commercial cleat control looks good

01:06:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=3961s)

mommy we see role reversal complete control looks at it they should be very near bakersfield and you're starting to get an oily cooling now you're weak in the truck you're out of 100k with foxy [Music] mach 3 that's the landing control room on your screen now here at edwards air force base roger that's looking good we're looking at him and you're coming right down the chute rudder active now looking good range 73 mild columbia work for air data you're out of 89k 2.8 still twice the speed of sun 89 thousand feet again good heroes to the right they all look good to it big s turns joe kerwin the location of it not in this country i have a live television picture from the long range optics at dryden right around the track the tracking data nav data and pre-planned trajectory or all one line on our plot boards here

01:08:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4080s)

line on our plot boards here all right out of 70 000 feet 1.8 range 42 miles that is absolutely what the flight plan called for isn't it absolutely i mean within inches there'd be overhead here look colombia we show you very slightly high in altitude coming down nicely and the pets mach 1.3 at 58 000 feet range 33 miles they're nearing the west edge of the bed on which they will land now looking good sonic booms will be beginning around this part of california in just a minute mach 1 at 51 000 feet range 28 miles columbia you're going subsonic now those will be the chase all right if we watch them we might pick it up everything looking good you're approaching the hack now right on the money we just had the sonic booms here i know if you can hear them or not some of you getting ready to start the big sweeping turn into noise

01:10:02 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4202s)

big sweeping turn into noise chase has him in sight and uh altimeter three zero zero thirty [Applause] it is still descending you're coming right around the heck looking beautiful and a downward glide of 20 degrees which is a very very precipitous or dropping like a stone as people on the ground say but fully included you're really looking good right on money right on the money [Applause] and we're seeing 1.3 g's coming around the hack and it on to final your winds on the surface are calm 25 000 feet not a lot of sun the pilots at this point are on the astronauts no they have it made now they're still dropping very quickly in the next thing they'll just six range 13 miles is change the attitude 22 000 feet control looking very smooth speed brake at 40. that's the shot the picture from the chase television picture now there it is you're right on the glide slope come on there it is right on glide slope approach center line looking great this tv from the chase plane sixteen 000 feet [Applause] mark 15 airspeed 271 knots

01:12:15 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4335s)

when they land here in about another thousand feet underneath 9 000 [Applause] 280 everything looks real good 5 000 [Applause] they're within five miles of the link strip right now [Applause] 2500 feet clear you heard him say pre-flip that means he's going to change the angle from a 20-degree glide path five-degree glide there you can see him leveling off that's it that was pre-flare and they did it the next thing is the gear to go down the landing gear here there it is right behind you there he is see him yeah it's incredible it looks like los angeles it's perfect and he's coming back from space down there they're down three touchdown wheels down and it's rolling yeah yeah you can see the little chase planes nearby

01:14:02 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4442s)

[Applause] welcome home columbia beautiful beautiful that's hardly the word it's jessica [Music] now they'll that plane will roll first and slow down to the table about it's going to get a lot of attention from now there you can see it behind us it was an exceptional site especially after having witnessed take off fifty four and a half hours ago and watch it come back houston we're estimating at least 24 minutes on the ammonia you're looking real good what they're going to do now is the technicians are going to go out there and sniff around to see if there are any toxic or hazardous chemicals the lake bed to flight directors instructions where prepare exhilaration they gave him 50 seconds at mission control to have a whoopi that's right then they had to put them back to work again i guess the whoopi is over already [Applause] don't expect the astronauts to pop right out they'll be in there for a while there's there's a lot to do and there are some toxic and explosive materials still perhaps aboard this aircraft so they'll have to go very carefully about that and astronauts young and crippling are still in their suits and there's a great deal to be done before we'll see them come at the end of this extraordinarily

01:16:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4560s)

at the end of this extraordinarily success mission they've got to power it down don't they they've got a lot of switches and toggles to shut off and believe it or not they still have a few tests to run as they power these systems down all at their leisure now i must say john young told me before they launched it that he would be happy if they got it up and got back they didn't he is there's a mission in about 45 minutes that's nominal time for second power down uh that was a the quiet voice of uh jack riley i believe at mission control beautiful things my love suenos may you walk in dreams through the freshness is after the whole idea of the shuttle that's what it's really all about to have it land here and someday it'll be even smoother than it was today but i can't imagine joe and tom that it could have been really smoother in the future than it was today it was extraordinary i thought as they say at nasa we now discover that our sound link up to heidi shulman in the vip section it is now nominal we can go back to heidi and here's what she has to say heidi thomas we tried to tell you a few moments ago a big cheer went up here as the columbia came down as i'm sure it did around the lake one of the people cheering brigadier general william anders who circled the moon on apollo 8. what were your impressions as you watched the shuttle land well heidi i guess my big impression was i was relieved i was relieved that it worked not that i had any real doubts but after having sweated out the shuttle since its uh concept way back in the early 70s to today i just had to worry about whether it would actually make it and to see it

[01:18:01 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4681s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4681s)

it would actually make it and to see it land out there in the lake why it just was a great feeling a really a tremendous feeling the way you did it in the old days no in the old days our program our landings were more like crashes we crashed in the ocean the soviets crashed into the into the in the earth uh this was a control landing and really really marks the beginning of a real new air in space uh space has really come aboard with the space shuttle did you anticipate then during the apollo program that this would be possible well we knew that if space was really to become a a useful and long-term part of our of our lives and society that we would have to somehow reduce cost of getting there and if one can reduce the cost of getting there then there are all kinds of things you can do but reusability was necessary and the apollo spacecraft or the soyuz spacecraft are just not reusable therefore we had to develop a shuttle or a vehicle that you could land take off a gland crystal airliner and this is the beginning there'll be modifications and changes but this is sort of the ford tri-motor of space and it looked pretty spectacular here today to me i wish i could okay general thank you we are going now to mata news in the public viewing and the other side of the heidi i'm over here on the eastern side of the dry bed the people are already beginning to leave but there were well over a hundred thousand people here at one time and this is the view a lot of them had they were standing on top of a van just like i am right now the moment this boom went off people began to zero in on the orbiters it was coming into view and a louder began it did not stop and the shuttle had come to a complete stop i have with me paula white and steve hazard two of the people who were just here watching what was your reaction well i really enjoyed watching it i thought i had a real sense of hatredism watching this and i just really enjoyed seeing what science is doing and how we're advancing and all kinds of things like that it's no easy task getting out here because there was so much traffic you had to endure a lot was it worked for you oh it was worth it we came early to make sure we'd make it make it here on time and and uh got in here last night and spent the night and uh it's a lot of trouble to go to for 30 seconds of action but worth it there's a feeling it comes from being here that could not probably be felt by

[01:20:00 (https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4800s)](https://www.youtube.com/watch?v=wdkA2RbBFrU&t=4800s)

here that could not probably be felt by those watching on television because you get the roar of the crowd behind you and that a lot of people are participating in the experience did you did you have that question yeah it's so spontaneous too you know everybody looked up and said there it is and we heard the boom and everybody started yelling and chinging everybody just felt good and we started jumping around it was a lot of fun they got a lot longer view than was first anticipated again must have had at least a full minute of view of the shuttle before it landed and i heard a lot of cries of people yelling we're number one and cheering on the united states and some people are even saying what should we do now say the pledge of allegiance and all in all it seemed to be very patriotic feeling on this side of the lake john back to you thank you um and they are still sniffing around the space shuttle the commander of the convoy of trucks that's out there said that uh there's the electric fan truck doing its job not very efficiently it looks to me fan isn't going around very well now they just turned it off i'm sorry they did find a small amount it's not unusual at all of monomethylhydrazine which is they can fuel for the engines which control part of the spacecraft's activity in space that was normal finding that fuel and they'll be removing that the wind will be removing a good bit of the the astronaut just reported a moment ago that what they're doing now and i don't can't tell whether it was crippen or young but i think it was crippen who said we're now going to have a spot of tea so they're sitting in there having a spot of tea having gone around the earth more than 36 times in days and six hours and just a stunning flight and a landing here that has just exhilarated everyone who saw it and we trust some of you at home as well we'll have more on this story after this

---

END